

# Industry Skills Standards

*Jobs and Skill Requirements  
for Entry-Level Workers  
2000-2005*

## Health & Biosciences

A project of the  
Connecticut Business & Industry Association,  
in collaboration with the  
School-to-Career Partnership  
of the State Departments of Education, Higher  
Education and Labor.



# An Introduction to the Health and Biosciences Cluster

*The “Health and Biosciences” cluster covers industries in the health field, such as hospitals, medical laboratories and the work of doctors and dentists. It also includes industries involved in researching and manufacturing medical drugs and other chemical and medical products, including those involved in the fast-changing biotechnology and biomedical field.*

Jobs in these industries are increasing in Connecticut. Positions range from those requiring very little post-secondary education, such as nurse’s aides and medical assistants, to those needing many years of college, such as doctors and dentists. Also, as medical, chemical and genetic research and development continues to grow in Connecticut, workers with associate’s, bachelor’s and graduate degrees in chemistry and biology will be needed.

The high school background needed for employment in this cluster would emphasize courses in biology, chemistry, math and using computers.

Organizations in this cluster, whether running hospitals or developing new medicines, also need employees with management, business and office backgrounds.

## Something to Consider

Jobs in this cluster are growing because a large part of our population is aging and needs medical care, and because constant new developments in medicine offer solutions to health problems. In addition, genetic research (biotechnology) is creating new products for human and animal health care, food production and safety, and improving the environment.

Careers in the Health and Biosciences cluster often appeal to people who are interested in keeping people healthy, who have an interest in chemistry and biology, who are fascinated by the idea that scientists are developing ways to change genes (the basic unit of heredity), who like collecting data and using scientific principles to solve problems, and who are patient enough to follow through on projects that take months or years to complete.

## Some Examples of What a Student Might Do

**Doctors and surgeons** diagnose and treat people with health problems, and they are helped by a large number of others with a variety of backgrounds and education. **Emergency medical technicians and surgical and medical assistants** help give medical care to patients. **Medical and clinical lab technicians** may analyze blood or tissue samples, while a **radiological therapy technologist and other technologists** might provide radiation or ultrasound treatments. **Home health aides** provide services in the home to people who are recovering from illness or who are elderly. Hospitals and nursing homes need **dietitians and nutritionists** who understand healthy eating habits, while **physical therapists** and their assistants help people regain their strength and their ability to move about easily.

# HEALTH AND BIOSCIENCES CLUSTER

## JOB CATEGORIES AND SELECTED JOB TITLES

Health and biosciences professionals have identified the job categories and titles they project will be in demand over the next five years. Education level requirements are indicated for each job requirement so those students can plan their coursework accordingly. However, there is some flexibility within these educational guidelines. What is checked represents the minimum amount of education required.

### Acute/Continuing Care Assistant

**Primary Function:** Under the direction of a licensed healthcare professional, prepares, stabilizes, examines and treats patients presenting medical problems; In conjunction with a health team, provides information or direct daily living assistance to individuals who have a chronic problem requiring ongoing health maintenance.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Dental Assistant		X		
Dietetic Technician		X		
Emergency Medical Technician		X		
Home Healthcare Worker	X			
Medical Assistant		X		
Nurse's Aide		X		
Psychiatric Assistant		X		
Residential Care Worker		X		
Surgical Technician		X		

### Therapy Assistant

**Primary Function:** Following a prescribed treatment plan, assists a licensed therapist to restore physical or mental functions to optimize the patient's long-term recovery.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Occupational Therapy Assistant		X		
Physical Therapy Assistant		X		
Recreational Therapy Assistant		X		
Respiratory Therapy Assistant		X		

## **Therapy Technologist**

**Primary Function:** Administers and monitors a prescribed treatment plan that may involve techniques such as radiation therapy or dialysis.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Dialysis Therapy Technologist		X		
Nuclear Medicine Therapy Technologist		X		
Radiological Therapy Technologist		X		
Ultrasound Therapy Technologist		X		

## **Support Specialist**

**Primary Function:** Fabricates, operates, maintains and/or repairs equipment in either the medical or biotechnical fields.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Biomedical Equipment Technician		X		
Dental Laboratory Technician		X		

## **Clerical Support**

**Primary Function:** Provides routine data management, processing, storage and retrieval; receives and processes both verbal and written information from either patient or provider.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Documentation/Data Coordinator	X			
Medical Records Technician		X		
Medical Administrative Assistant		X		
Medical Office Manager		X		
Patient Account Representative		X		
Quality Assurance Technician		X		

## **Laboratory Technologist**

**Primary Function:** Performs routine qualitative and quantitative analysis of specimens to provide information used in the diagnosis and treatment of disease.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Cytogenetic Technologist		X		
Histologist		X		
Medical Laboratory Technologist		X		
Phlebotomist		X		

## Chemical/Biotechnical Technician

**Primary Function:** Assists research professionals with experiments, sets up standard laboratory equipment, performs routine tests, maintains records of the results, prepares solutions and other mediums, orders and maintains supplies.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Clinical Research Associate		X		
Laboratory Support Technician		X		
Medical Research Associate		X		
Research Assistant		X		

## Laboratory Animal Technician

**Primary Function:** Assists with the care, feeding and general husbandry of animals used in biomedical experiments. Observes animals and reports problems. Maintains supplies and records.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Entry-level Certified Animal Lab Technician		X		

## Health-Diagnosing Practitioner

**Primary Function:** This professional, who is highly trained and skilled, diagnoses medical conditions and prescribes treatment for patients with a variety of illnesses or complaints. An MD (Medical Doctor) or DO (Doctor of Osteopathy) and residence in the subspecialty area (four years beyond college plus three years internship and residency training) is required.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Cardiologist%				X
Dentist% (DMD, 4 years post BS)				X
Geriatrician%				X
Internist%				X
Obstetrician/Gynecologist%				X
Opthomologist%				X
Pediatrician%				X

\* = appears in other clusters

% = certification required

## **Health Assessment and Treatment Practitioners**

**Primary Function:** Assess and treat patients for chronic diseases or complaints that require ongoing health maintenance. They often work in teams to coordinate treatment for physical, emotional, medial and surgical needs of the patient. Certification is often needed to practice in these fields.

<b>Job Title</b>	<b>H.S. Diploma</b>	<b>A.S.</b>	<b>BA/BS</b>	<b>Masters+</b>
Advanced Practice Nurse (APRN Certificate)⌘				<b>X</b>
Audiologist				<b>X</b>
Nurse Practitioner (MSN, MS)⌘				<b>X</b>
Nutritionist (certification required to work in hospitals)			<b>X</b>	
Occupational Therapist⌘			<b>X</b>	
Physical Therapist⌘			<b>X</b>	
Physician's Assistant⌘				<b>X</b>
Registered Nurse (RN)⌘			<b>X</b>	
Respiratory Therapist⌘			<b>X</b>	
Social Worker (medical, psychiatric)⌘*				<b>X</b>
Speech Pathologist⌘*				<b>X</b>

## **Biomedical Sciences**

**Primary Function:** Engage in clinical investigation or other research, or in production, technical writing or related activities. They conduct research to develop new drugs and/or treatments. A faster-than-average job growth is predicted because of advances in medical technology.

<b>Job Title</b>	<b>H.S. Diploma</b>	<b>A.S.</b>	<b>BA/BS</b>	<b>Masters+</b>
Biochemist (Ph.D preferred)*				<b>X</b>
Biological Scientist (Ph.D preferred)				<b>X</b>
Biomedical Engineer⌘				<b>X</b>
Medical/Clinical Research Associate			<b>X</b>	
Medical Scientist (Ph.D preferred)				<b>X</b>
Molecular Biologist (Ph.D preferred)				<b>X</b>
Pharmacologist (Ph.D preferred)				<b>X</b>
Toxicologist (Ph.D preferred)*				<b>X</b>

\* = appears in other clusters

⌘ = certification required

## Health Technologist

**Primary Function:** Perform complex chemical, biological, technological, hematological, immunologic and bacteriologic tests. Examine samples for chemical content or reaction. Supervise technicians.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Medical Technologist				X
Radiological Technologist			X	

## Health Care Management

**Primary Function:** The need for health care managers has grown as the result of rapid change in health care delivery. Clinics and hospitals need business professionals to apply their expertise to the health care field, where both cost containment and quality patient care are needed. This job category is in a state of flux due to policy changes within companies regarding confidentiality requirements, and new laws influencing Medicare/Medicaid reimbursement and managed care.

Job Title	H.S. Diploma	A.S.	BA/BS	Masters+
Computer Systems Analyst/Consultant*				X
Health Care Financial Officer				X
Health Care/Hospital Executive				X
Health Care Marketing Manager*				X
Health Policy Consultant*			X	
Health Systems Analyst				X
Human Resources Specialist/Manager*				X
Managed Care Consultant*				X
Medical Records Administrator/Medical Director			X	
Medicaid/Medicare Managed Care Consultant*				X
Operations and Research Analyst*				X
Public Relations/Media Relations Manager*			X	
Special Care and Long-Term Care Administrator				X
Quality Assurance/Utilization Review Manager			X	
Technical Medical Writer				X

\* = appears in other clusters

⌘ = certification required

## **Environmental Health**

**Primary Function:** Many of the following jobs are also listed under the Environmental, Natural Resources, and Agricultural cluster. Since environmental regulations have become more stringent for health care facilities and pharmaceutical companies, environmental health professionals also find employment in that career cluster.

<b>Job Title</b>	<b>H.S. Diploma</b>	<b>A.S.</b>	<b>BA/BS</b>	<b>Masters+</b>
Biomedical Engineer (Ph.D desirable)⌘				<b>X</b>
Environmental Health and Safety Officer⌘				<b>X</b>
Environmental Health Specialist⌘				<b>X</b>
Occupational Health and Safety Technologist⌘			<b>X</b>	
Risk and Hazard Evaluator⌘			<b>X</b>	
Sanitarian*			<b>X</b>	

## **Health Researchers**

**Primary Function:** Provide objective measurements in a variety of areas, including; health economics, finance, services and management. Researchers helps health care companies, providers and policymakers balance the need for quality health care vs. cost savings. Health researchers also study the spread and control of infectious diseases, such as AIDS.

<b>Job Title</b>	<b>H.S. Diploma</b>	<b>A.S.</b>	<b>BA/BS</b>	<b>Masters+</b>
Biostatistician (Ph.D sometimes preferred)				<b>X</b>
Epidemiologist (Ph.D sometimes preferred)				<b>X</b>

\* = appears in other clusters

⌘ = certification required

## Health and Biosciences (High School or Associate's Degree)

<b>Technical Skills</b>	<b>Acute &amp; Continuing Care Assist.</b>	<b>Therapy Assistant</b>	<b>Therapy Tech.</b>	<b>Support Specialist</b>	<b>Clerical Support</b>	<b>Lab Tech.</b>	<b>Chemical &amp; Biotech Tech.</b>	<b>Laboratory Animal Tech.</b>
<b><i>Reading Instructions:</i></b>								
Follow complex instructions such as protocols, treatment plans, or material safety data sheets	X	X	X	X		X	X	X
Discern step sequence in general instructions	X	X	X	X	X	X	X	X
<b><i>Reading Research:</i></b>								
Locate information in technical references and material manuals	X	X	X	X	X	X	X	X
Observe client or instrumentation, assess and put in order priority factors, and report accurate findings	X	X	X	X		X	X	X
Relate descriptive language to technical concepts		X	X	X		X		X
<b><i>Reading Processing:</i></b>								
Comprehend the meaning of technical terminology	X	X	X	X	X	X	X	X
Interpret signs, symbols and labels	X	X	X	X		X	X	X
Interpret technical references and material regulations	X	X	X	X		X	X	X
<b><i>Writing Reports, Letters and Memos:</i></b>								
Write complete, understandable sentences	X	X	X	X	X	X	X	X
Use correct spelling, grammar and syntax	X	X	X	X	X	X	X	X
Use dictionary and technical resources	X	X	X	X	X	X	X	X
Order ideas by importance and support them	X	X	X	X	X	X	X	X
Before writing, outline and organize thoughts	X	X	X	X	X	X	X	X
Structure report by topic per paragraph	X	X	X	X	X	X	X	
Develop simple technical reports	X	X	X	X	X	X	X	X
Write simple and logical instructions & sequences	X	X	X	X	X	X	X	X

<b><i>Writing Logs and Records:</i></b>		81						
Keep accurate notes , logbooks, protocols	X	X	X	X	X	X	X	X

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Describe physical, chemical and operational situations in clear language	X	X	X	X		X	X	X
<b>Writing Graphics:</b>								
Understand graphics that illustrate points	X	X	X	X	X	X	X	X
<b>Mathematics:</b>								
Spot inconsistencies and outlines in a series	X	X	X	X	X	X	X	X
Interpret meters and scales	X	X	X	X		X	X	X
Use a scientific calculator			X	X		X	X	
Interpret exponential and logarithmic relations							X	
<b>Physical situations:</b>								
Extrapolate known values to new levels			X	X		X	X	
<b>Practical Physical/Biological Sciences:</b>								
Apply temperature, pressure and volume relations concepts			X	X		X	X	X
Apply safe handling of hazardous materials	X		X	X		X	X	X
Use basic measurement instruments	X	X	X	X		X	X	X
Basic animal science			X	X		X	X	X
Basic anatomy	X	X	X	X		X	X	X
Basic biochemistry			X	X		X	X	X
Basic immunobiology			X	X		X	X	X
Basic microbiology			X	X		X	X	X
Basic molecular biology			X	X		X	X	X
Basic organic chemistry			X	X		X	X	X
Basic physiology	X	X	X	X		X	X	X
Basic virology	X	X	X	X		X	X	X
Basic zoology						X	X	X
Basic toxicology						X	X	X

<b>Investigation:</b>								
Use of comparisons, contrasts, sequences			X	X			X	X
Use of sampling and testing principles			X	X		X	X	X
Distinguish relevant from irrelevant	X	X <sup>2</sup>	X	X		X	X	X
Assess reliability of sources used		X	X	X		X	X	X

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Make critical judgments		X	X	X		X	X	X
Apply basic scientific method			X	X			X	X
<b>Speaking:</b>								
Phrase technical concepts clearly	X	X	X	X	X	X	X	X
Formulate questions to get clarification	X	X	X	X	X	X	X	X
Repeat information accurately	X	X	X	X	X	X	X	X
Use appropriate medical/technical terminology correctly	X	X	X	X	X	X	X	X
<b>Listening:</b>								
Follow verbal instructions	X	X	X	X	X	X	X	X
Remember by listening and watching	X	X	X	X	X	X	X	X
Think about what is not said	X	X	X	X	X	X	X	X
Assess speaker's understanding of the situation	X	X	X	X	X	X	X	X
Wait and think before speaking/answering	X	X	X	X	X	X	X	X
<b>Processing:</b>								
Use critical thinking/questioning to assess content	X	X	X	X	X	X	X	X
Analyze what's being said for accurate content	X	X	X	X	X	X	X	X
Obtain accurate answers	X	X	X	X	X	X	X	X
Transcribe information with accuracy and precision	X	X	X	X	X	X	X	X
Validate information before passing it along	X	X	X	X	X	X	X	X

<b>Logic:</b>								
Apply cause-and-effect principles	X	X	X	X		X	X	X
Apply correlation equations and principles	X	X	X	X		X	X	X
Apply deductive and inductive reasoning to situations	X	X	X	X		X	X	X
Organize information for diagnosis	X	X	X	X		X	X	X
Interpret basic information	X	X	X	X	X	X	X	X
<b>Problem solving:</b>								

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Apply background and academic knowledge to a problem	X	X	X	X	X	X	X	X
Test premise		X	X	X		X	X	X
Detect faulty data		X	X	X		X	X	X
Understand troubleshooting vs. long-term problem solving		X	X	X		X	X	X
<b>Analytical:</b>								
Make organized subsets/tabulate information		X	X	X	X	X	X	X
Provide examples for comparison	X	X	X	X		X	X	X
Interpret trends	X	X	X	X		X	X	X
<b>Related Technical Knowledge:</b>								
Principles of instruments used, such as microscopes, autoclaves, analyzers, centrifuges, shields, safety hoods			X	X		X	X	X
Basic laboratory procedures such as pipetting, sterile technique; knowledge of factors such as pressure, air sensitivity			X	X		X	X	X
Inventory and supply maintenance	X	X	X			X	X	X
Phlebotomy	X	X	X			X		
Aseptic technique	X	X	X			X	X	X
Basic human growth and development	X	X	X			X		

General preventive health practices, such as nutrition, stress management	X	X	X			X		X
<b>Related Technical Knowledge (cont.)</b>								
Understanding of illness prevention	X	X	X		X	X		X
Routine maintenance and calibration of equipment	X	X	X		X	X	X	X
Monitoring quality of sample or specimen	X	X	X			X	X	X
Lifting techniques	X	X	X		X	X	X	X
<b>Computer Skills:</b>								
Use spreadsheet programs		84	X		X	X	X	X
Use drawing/graphics programs			X		X	X	X	X

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Use statistical programs			X			X	X	X